

32. The liquid-crystal display of claim 31, wherein said method of obtaining each of said dry deposited layers comprises: treating a dry deposited layer with an ion beam in a direction making from about 10 to about 20 degree angle with the plane of the electrodes.

34. The liquid-crystal display of claim 1, wherein said particle beam in is directed at said dry deposited layer at an angle from about 10 to about 20 degree angle with the plane of the electrodes.

35. The liquid-crystal display of claim 9, wherein said particle beam in is directed at said dry deposited layer at an angle from about 10 to about 20 degree angle with the plane of the electrodes.

36. The liquid-crystal display of claim 30, wherein said particle beam in is directed at said dry deposited layer at an angle from about 10 to about 20 degree angle with the plane of the electrodes.

REMARKS

Attached hereto is a marked-up version of the changes made to the specification and to the claims by the current amendments. The attached pages are captioned

"Version with Markings to Show Changes Made."

Claims 2, 3 and 34 to 36 are cancelled.

The Final Action has objected to the specification because the phrases "dry deposited liquid-crystal alignment layer" and "dry deposited layer" appear to refer to different layers of a multi-domain liquid-crystal display. In response, Applicants have amended the specification to clearly recite a "dry deposited layer" in all instances, for

purposes of clarity. Applicants have also amended claims 4, 10 to 11, 18, 22, 26, and 32 to 36 to clearly recite a “dry deposited layer”. ✓

The Final Action has rejected claims 3 and 12 under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, Final Action states that the limitation “said material” in claims 3 and 12 lacks antecedent basis. Claim 3 is cancelled. Accordingly, the rejection of claim 3 is moot. Applicants respectfully point out that antecedent basis for “said material” in dependant claim 12 is found in claim 11, from which claim 12 depends. Claim 11 clearly recites in line 19 “depositing on a substrate *a material* to form a transparent dry deposited layer” (emphasis added). Accordingly, claim 12 has not been amended.

Claims 1-3 and 34 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,061,114 to Callegari et al. (hereinafter “Callegari”). Claims 2, 3 and 34 have been cancelled, accordingly the rejection of claims 2, 3 and 34 is moot.

Callegari is cited by the Final Action for teaching a method of preparing a multi-domain dry deposited liquid-crystal alignment layer using mechanical mask and ion beam treatments. Applicants respectfully point out that Callegari does not teach a method of preparing a multi-domain liquid crystal display using a dry deposit alignment layer and two or more alignment methods selected from the group consisting of: mechanical mask, photo-resist, UV treatment and ridge and fringe field, as is now clearly claimed in claim 1. In fact, Callegari teaches away from the use of photo resist and UV irradiation alignment methods, which are traditionally used with polymer film technique rather than dry deposition technique. Callegari cites such methods as “very expensive and time consuming . . . [and] containing a large number of processing steps, which creates more possibility for error, lower device yields, and increases in fabrication time and device cost.” (column 1, lines 27 – 33).

Moreover, Callegari is directed to a twisted neumatic liquid crystal display device (see column 3, lines 24 to 26). Claim 1 is now clearly directed to a multi domain liquid crystal display, which is operable in the in-plane switching mode. For at least these reasons, claim 1 is clearly not anticipated by Callegari. Accordingly, the rejection of claim 1 under 35 U.S.C. § 102(e) should be withdrawn and claim 1 should be allowed.

Claims 1 and 4 to 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,124,914 to Chaudhari et al. (hereinafter "Chaudhari") in view of Callegari.

Applicants respectfully submit that the combination of Chaudhari and Callegari neither describes nor suggests all of the elements of the present invention, as claimed in independent claim 1. Chaudhari teaches a method of using a polyamide alignment film layer in combination with a photo resist or UV alignment technique to form a single domain liquid crystal display device. There is no teaching or suggestion in Chaudhari for a multi-domain device, a dry deposited alignment film, or for ridge and fringe treatment methods, as claimed in claim 1.

As discussed above, Callegari teaches a method of using a dry deposit alignment layer and ion beam treatment. There is no teaching in Callegari for application of UV, photo-resist or ridge and fringe field treatment methods to a dry deposited alignment film. In contrast, as discussed, Callegari teaches away from the use of photo-resist and UV irradiation treatments traditionally used with polyamide films. (column 1, lines 27 – 33). Accordingly, there is no teaching in either Chaudhari or Callegari for a method of preparing a multi-domain liquid crystal display comprising a step of aligning the dry deposited layer using at least two methods selected from the group consisting of: mechanical mask, photo-resist, UV treatment, and ridge and fringe field treatments.

Moreover, claim 1 now clearly claims a multi-domain liquid crystal display that is operable in the in-plane switching mode. Neither Chaudhari nor Callegari disclose a liquid crystal display that is operable in the in-plane switching mode. In contrast, both Chaudhari and Callegari are directed to twisted nematic type cells. Thus, the combination of Chaudhari and Callegari does not teach or suggest all the limitations of the instant claims.

In order to establish a proper *prima facie* case of obviousness, it is required that the combination of references teaches or suggests all the limitations of the claim in question. Since the combination of Chaudhari and Callegari does not teach or suggest all the limitations of claim 1, it does not render claim 1 obvious. Accordingly, the rejections of claim 1 and claims 4 to 7, which depend directly or indirectly therefrom under 35 U.S.C. § 103(a) should be withdrawn and claim 1 and claims 4 to 7 should be allowed.

Claims 1, 8 and 26 to 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,256,080 to Colgan et al (hereinafter "Colgan") in view of Callegari.

Applicants respectfully submit that the combination of Colgan and Callegari neither describes nor suggests all of the elements of the present invention claimed in independent claims 1 and 9. Claims 1 and 9 clearly recite a method of preparing a multi-domain liquid crystal display comprising a step of aligning the dry deposited layer using at least two methods selected from the group consisting of: mechanical mask, photo-resist, UV treatment, and ridge and fringe field treatments. Colgan is directed to a method of producing a single domain liquid-crystal display, wherein the alignment layer is a polyamide. Colgan does not teach a method of producing a multi-domain liquid crystal display, much less a multi-domain liquid-crystal display formed using a dry deposited alignment layer, as is clearly recited in independent claims 1 and 9.

Additionally, Colgan does not teach UV or ridge and fringe field treatments for aligning the polyamide layer.

As discussed above, Callegari teaches a method of using a dry deposit alignment layer and ion beam treatment. There is no teaching in Callegari for application of UV, photo-resist or ridge and fringe field treatment methods to a dry deposited alignment film. In contrast, for the reasons discussed above, Callegari teaches away from the use of photo-resist and UV treatments traditionally used with polyamide films. Accordingly, there is no suggestion in Callegari for combining Colgan and Callegari.

In summary, Applicants respectfully submit that independent claims 1 and 9 are patentably distinguishable over the Colgan patent and the Callegari patents, either alone or in combination. Claim 8 depends from claim 1, so it is patentably distinguishable for at least the same reason as claim 1. Claims 26 to 28 depend from claim 1 and 9, so they are also patentably distinguishable for at least the same reasons as claim 9. Applicants respectfully request reconsideration and withdrawal of the section 103 rejection of claims 1, 8, and 26 to 28.

Claims 9 to 20, 22 to 25, 29 to 30 and 35 to 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,124,914 to Chaudhari et al. (hereinafter "Chaudhari") in view of Callegari.

Applicants respectfully submit that the combination of Chaudhari and Callegari neither describes nor suggests all of the elements of the present invention. Claims 9, 29 and 30 are directed to a multi-domain liquid crystal display wherein alignment of a dry deposited liquid crystal alignment layer is obtained by a method selected from the group consisting of: mechanical mask, photo-resist, UV treatment and ridge and fringe field methods. As discussed above, Chaudhari teaches the use of a polyamide alignment film layer for forming a single domain liquid crystal display device.

Callegari teaches a method of using a dry deposit alignment layer and ion beam treatment. There is no teaching in Callegari for application of UV, photo-resist or ridge and fringe field treatment methods in combination with a dry deposited alignment film. For the reasons discussed above, Callegari teaches away from the use of photo-resist and UV treatments traditionally used with polyamide films. Accordingly, there is no suggestion in Callegari for combining Chaudhari and Callegari.

As such, even if the teachings of the Chaudhari and Callegari patents were somehow combined, as attempted by the Examiner, the resulting combination would still be deficient in teaching or suggesting the claimed subject matter. Thus, the combination of Chaudhari and Callegari does not teach or suggest all the limitations of the instant claims.

As mentioned above, to establish a proper *prima facie* case of obviousness, it is required that the combination of references teaches or suggests all the limitations of the claim in question. Since the combination of Chaudhari and Callegari does not teach or suggest all the limitations of independent claims 9, 29 and 30, the combination therefore does not render claims 9, 29 and 30 obvious. Accordingly, the rejections of claim 9, claims 10 to 20, 22 to 25, which depend directly or indirectly therefrom, and claims 29 and 30 under 35 U.S.C. § 103(a) should be withdrawn.

Claims 31 to 33 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,949,509 to Ohe et al (hereinafter "Ohe") in view of Callegari.

Applicants respectfully submit that the combination of Ohe and Callegari neither describes nor suggests all of the elements of claim 31. Claim 31 is directed to a wide viewing angle in-plane switching mode liquid-crystal display. Claim 21 further requires a dry deposited alignment layer and ion beam treatment. As conceded by the Action, Ohe fails to disclose a dry deposited alignment layer. In contrast, the alignment layer

taught by Ohe is a polyamide film. As such, Ohe is deficient in teaching or suggesting the claimed subject matter of claim 31.

Callegari also fails to teach or suggest the claimed subject matter of claim 31. Callegari is not directed to an in-plane device. Rather, Callegari is directed to a twisted nematic type liquid crystal display (see column 3, lines 24 to 27). Moreover, there is no teaching in Callegari for application ion beam treatment methods to create an in-plane liquid crystal device. Accordingly, there is no suggestion in Callegari for combining Ohe and Callegari, absent hindsight from Applicants' invention.

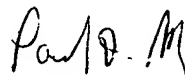
In summary, Applicants respectfully submit that independent claim 31 is patentably distinguishable over the Ohe and Callegari patents, taken either alone or in combination. Claims 32 and 33, which depend from claim 31, are patentably distinct over the Ohe and Callegari combination for at least the same reasons as claim 31. Applicants respectfully request reconsideration and withdrawal of the section 103 rejection of claims 31 to 33.

Based on the above, applicants respectfully request reconsideration of the present application, withdrawal of the objections, the 35 U.S.C.112, second paragraph rejection, the 35 U.S.C. § 102(e), and the 35 U.S.C. § 103(a) rejections, and allowance of claims 1, 4 to 20 and 22 to 36. Accordingly, an indication of the allowability of all pending claims by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

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